FIG. 11 is a flow diagram illustrating the processing of discovering a computer system. This component is invoked when a computer system wants to send a message to another computer system. The component is passed the identification of the computer system to be discovered. The authentication server maps the identification of online computer systems to their corresponding addresses. In block **1101**, the component sends a discover request message to the authentication server. In block **1102**, the component receives a discover response message from the authentication server. In decision block **1103**, if the computer system is online, then the component continues at block **1104**, else the component returns an indication that the computer system is not online. In block **1104**, the component sends a validate message to the computer system at the received address. In block **1105**, the component receives a validate response message from the computer system or an error message. In decision block **1106**, if the computer system has been validated, then the component returns an indication that the computer system is online, else the component returns an indication that computer system is not online.

From the foregoing it will be appreciated that although specific embodiments of the file sharing system have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except by the appended claims.

We claim:

1. A method in a first computer system for sharing a file stored at second computer system, the file having content, the method comprising:

receiving from the second computer system a notification that the file is to be shared with the first computer system, the notification including metadata of the file that identifies the file;

creating a virtual file using a file system of the first computer system, the virtual fire identifying the file but does not include the content of the file;

storing the metadata of the file in association with the virtual file; and

after the file is changed at the second computer system, receiving at the first computer from the second computer system metadata for the file and updating the metadata stored in association with the virtual file based on the received metadata;

wherein when the virtual file is accessed, the metadata that identifies the file is used to retrieve the content of the file from the second computer system.

2. The method of claim **1** including when the virtual file is accessed, retrieving the file stored at the second computer system using the metadata associated with the virtual file.

3. The method of claim **2** wherein when the virtual file is accessed, a virtual file component receives a notification from the file system, retrieves metadata associated with the virtual file, and controls the retrieving of the file stored at the second computer system.

4. The method of claim **2** including before retrieving the file stored at the second computer system, retrieving from a server an address for the second computer system.

5. The method of claim **4** wherein the address is an IP address.

6. The method of claim **4** including before retrieving the file stored at the second computer system, retrieving from the server a public key for the second computer system.

7. The method of claim **6** wherein the public key is used to validate authenticity of the second computer system.

8. The method of claim **2** wherein including before retrieving the file stored at the second computer system, logging on to a server.

9. The method of claim **8** wherein the logging on includes providing an address to the server and a public key.

10. The method of claim **2** wherein the file is transferred on a peer-to-peer basis.

11. The method of claim **1** wherein metadata for the created virtual file is stored as attributes of the created virtual file.

12. The method of claim **1** wherein the virtual file has a file type indicating that it is a virtual file.

13. The method of claim **12** wherein a virtual file program is associated with the file type so that when the virtual file is accessed the virtual file program executes to coordinate the access.

14. The method of claim **1** wherein the created virtual file is stored in a file system folder associated with the second computer system.

15. The method of claim **1** wherein the metadata includes an identifier of the second computer system.

16. The method of claim **1** including requesting the second computer system to provide current metadata for the virtual file.

17. The method of claim **16** wherein the requesting is performed when the first computer system logs on to a server.

18. The method of claim **1** wherein the first computer system and the second computer system are members of a group of computer systems that share files.

19. The method of claim **18** wherein one computer system of the group is designated as a group owner, the computer system that stores the shared file is designated as the file owner, and changes to the metadata of the shared file are sent from the file owner to the group owner for distribution to other member of the group.

20. The method of claim **18** wherein one computer system of the group is designated as a group owner, the computer system that stores the shared file is designated as the file owner, and the file owner transfers the shared file to the group owner to act as a proxy file owner.

21. The method of claim **1** wherein after the file is changed, the metadata is received at the first computer system wherein the first computer system does not request the metadata.

22. A method in a first computer system for sharing a file stored at second computer system, the method comprising:

receiving from the second computer system a notification that the file is to be shared with the first computer system, the notification including metadata of the file;

creating a virtual file using a file system of the first computer system;

storing the metadata of the file in association with the virtual file;

after the file is changed at the second computer system, receiving from the second computer system metadata for the file and updating the metadata stored in associated with the virtual file based on the received metadata; and

when the virtual file is accessed, retrieving the file stored at the second computer system using the metadata associated with the virtual file.

23. The method of claim **22** wherein when the virtual file is accessed, a virtual file component receives a notification from the file system, retrieves metadata associated with the virtual file, and controls the retrieving of the file stored at the second computer system.